

## [DOCUMENT] ABSTRACT

An optical encoder includes: a light source; a first grating, which is composed of an amplitude grating having a first grating period P1, for spatial amplitude modulation of light from the light source; a second grating, which is composed of a phase grating having a second grating period P2, for spatial phase modulation of light from the first grating; a third grating, which is composed of an amplitude grating having a third grating period P3, for spatial amplitude modulation of light from the second grating; and a light receiving element for receiving light of the third grating, wherein the encoder detects a relative displacement between the respective gratings, thereby enhancing OTF from the light source to the light receiving element, and greatly improving efficiency of utilizing light.